

CLAIMS

1           1.       A method for dynamically updating a property of a live object at remote  
2 clients, comprising:  
3           receiving a first message from a remote input source, the first message  
4           identifying the live object and containing data for updating a property  
5           of the live object;  
6           identifying remote clients that have registered for updates to the live object,  
7           wherein the remote clients are distributed on a network; and  
8           routing a second message via the network to the registered clients, the second  
9           message identifying the live object and containing the data for  
10          updating the property of the live object;  
11          wherein the registered clients are adapted to process the data to cause the  
12          update to the property of the live object.

1           2.       The method of claim 1, wherein the live object is identified by an object  
2 ID.

1           3.       The method of claim 2, wherein the object ID comprises a hierarchical  
2 namespace.

1           4.       The method of claim 1, wherein the live object is identified as a point in a  
2 document object model.

1           5.       The method of claim 1, wherein the data for updating the property of the  
2 live object identify the property relative to a point in a document object model.

1           6.       The method of claim 1, further comprising:  
2           receiving a registration request from a client, the registration request  
3           identifying the live object with an object ID.

- 1           7.     The method of claim 1, further comprising:  
2                 receiving a request from a client for an activation module, the activation  
3                 module adapted to identify any live objects at the client; and  
4                 providing the activation module to the client.
- 1           8.     The method of claim 1, wherein a client is adapted to generate a  
2 registration request registering for updates to properties of live objects at the client.
- 1           9.     The method of claim 1, wherein each registered client is adapted to  
2 generate executable code responsive to the data in the second message and execute the  
3 executable code to cause the update to the property of the live object.
- 1           10.    The method of claim 1, wherein the data for updating a property of the live  
2 object comprise an executable script and wherein each registered client is adapted to  
3 execute the executable script.
- 1           11.    The method of claim 1, wherein the second message identifies a handler  
2 for updating the property of the live object responsive to the data in the second message.
- 1           12.    The method of claim 11, wherein the second message implicitly identifies  
2 the handler.
- 1           13.    The method of claim 11, wherein the second message explicitly identifies  
2 the handler.
- 1           14.    The method of claim 1, wherein the change to the property of the  
2 identified live object is associated with a visual representation of the object at a client.
- 1           15.    The method of claim 1, wherein the change to the property of the  
2 identified live object is not associated with a visual representation of the object at a client.

1           16.    The method of claim 1, further comprising:  
2                   processing the first message from a first format to a second format to produce  
3                   the second message.

1           17.    The method of claim 1, wherein the first message and the second message  
2   are identical.

1           18.    A dynamic content routing network for enabling updating a property of a  
2   live object at a client coupled to the network, comprising:  
3                   a node for receiving a message from a remote input source, the message  
4                   identifying the live object and containing data for updating a property  
5                   of the live object, for maintaining a registry of remote clients coupled  
6                   to the network that have registered to receive updates to properties of  
7                   the live object, and for routing the message to the registered clients;  
8                   wherein each registered client is adapted to process the data to cause the  
9                   update to the property of the live object.

1           19.    The routing network of claim 18, further comprising:  
2                   a gateway in communication with the node and the input source and adapted  
3                   to receive the message from the input source and deliver the message  
4                   to the node.

1           20.    The routing network of claim 19, wherein there are a plurality of gateways,  
2   further comprising:  
3                   a load balancer for balancing a load on the routing network by distributing  
4                   messages from the input source among the plurality of gateways.

1           21.    The routing network of claim 18, wherein the node is further adapted to  
2   receive registration request messages from the clients, the registration request messages  
3   registering for updates to properties of the live object.

1           22.    The routing network of claim 21, wherein there are a plurality of nodes,  
2 further comprising:  
3           a load balancer for balancing a load on the routing network by distributing the  
4           registration request messages from the clients among the plurality of  
5           nodes.

1           23.    The routing network of claim 18, further comprising:  
2           an application server for serving an activation module to the clients, the  
3           activation module adapted to enable identification of live objects at the  
4           clients.

1           24.    The routing network of claim 23, wherein the activation module is further  
2 adapted to generate a registration request from a client to the node for registering to  
3 receive updates to properties of the live object.

1           25.    The routing network of claim 23, wherein the activation module is further  
2 adapted to receive the message routed to the registered clients and process the data to  
3 cause the update to the property of the live object.

1           26.    The routing network of claim 18, further comprising:  
2           a queue module for holding messages from the input source that have been  
3           received but not yet processed by the node.

1           27.    The routing network of claim 18, wherein the registry maintained by the  
2 node comprises:  
3           a data structure identifying live objects for which clients have registered, and  
4           an address of each registered client.

1           28.    The routing network of claim 18, wherein there are a plurality of nodes  
2 and wherein at least some of the nodes receive the message from the input source.

1           29.    The routing network of claim 19, wherein there are a plurality of gateways  
2   and a plurality of nodes in each of a plurality of clusters and wherein each gateway within  
3   a cluster maintains a communications link with each node within the cluster and wherein  
4   each gateway within a cluster maintains a communication link with at least one gateway  
5   in each of the other clusters.

1           30.    A computer program product comprising:  
2           a computer-readable medium having computer program code embodied  
3           therein for updating properties of live objects at a client, the computer  
4           program code adapted to perform the steps of:  
5           identifying the live objects at the client;  
6           receiving via a network an update message identifying a live object at the  
7           client and containing data for updating a property of the live object;  
8           and  
9           processing the data to cause the update to the property of the live object.

1           31.    The computer program product of claim 30, wherein the step of  
2   identifying the live objects at the client comprises the step of:  
3           analyzing a web page displayed at the client to identify object IDs of live  
4           objects on the web page.

1           32.    The computer program product of claim 30, wherein the step of  
2   identifying the live objects at the client comprises the step of:  
3           receiving data responsive to a solicitation of input, the data identifying the live  
4           objects at the client.

1           33.     The computer program product of claim 30, wherein the program code is  
2 further adapted to perform the step of:  
3                 sending via the network a registration message indicating the live objects  
4                 identified at the client to a remote routing network;  
5                 wherein the update message is received from the remote routing network.

1           34.     The computer program product of claim 30, wherein the program code is  
2 further adapted to perform the step of:  
3                 maintaining a connection with a remote routing network;  
4                 wherein the update message is received from the remote routing network.

1           35.     The computer program product of claim 34, wherein the program code is  
2 further adapted to perform the step of:  
3                 terminating the connection with the remote routing network responsive to an  
4                 action occurring at the client.

1           36.     The computer program product of claim 30, wherein the live object is  
2 identified as a point in a document object model.

1           37.     The computer program product of claim 30, wherein the step of processing  
2 the data to cause the update to the property of the live object comprises the step of:  
3                 changing a property of a point in a document object model.

1           38.     The computer program product of claim 30, wherein the processing step  
2 comprises the steps of:  
3                 generate executable code responsive to the data in the update message; and  
4                 executing the executable code to cause the update to the property of the live  
5                 object.

1           39.     The computer program product of claim 30, wherein the data for updating  
2     a property of the live object comprise an executable script and wherein the processing  
3     step comprises the step of:  
4                 executing the executable script.

1           40.     The computer program product of claim 30, wherein the update message  
2     specifies a handler for changing the property of the live object responsive to the data in  
3     the update message.

1           41.     The computer program product of claim 40, wherein the update message  
2     implicitly specifies the handler.

1           42.     The computer program product of claim 40, wherein the update message  
2     explicitly specifies the handler.

1           43.     The computer program product of claim 30, wherein the step of processing  
2     the data to cause the update to the property of the live object comprises the step of:  
3                 changing a property associated with a visual representation of the identified  
4                 live object.

1           44.     The computer program product of claim 30, wherein the step of processing  
2     the data to cause the update to the property of the live object comprises the step of:  
3                 changing a property not associated with a visual representation of the  
4                 identified live object.

1           45.     A system for updating properties of live objects at a plurality of remote  
2     clients, comprising:  
3                 a routing network in communication with the plurality of remote clients, the  
4                 routing network adapted to enable the plurality of clients to register to  
5                 receive updates to properties of live objects, to receive an update

6 message from a remote input source including data for updating a  
7 property of an identified live object, and to route the update message to  
8 the remote clients that have registered for the identified live object;  
9 wherein each registered client is adapted to process the data to cause the  
10 update to the property of the live object.

1 46. The system of claim 45, wherein each client executes an activation module  
2 adapted to enable identification of live objects at the client and register for updates to  
3 properties of the identified live objects with the routing network.

1 47. The system of claim 46, the routing network is further adapted to provide  
2 the activation module to the clients.

1 48. The system of claim 45, wherein the remote input source is adapted to  
2 utilize a director console module to provide the update message to the routing network.

1 49. The system of claim 45, wherein the input source is adapted to utilize a  
2 content management system module to provide the update message to the routing  
3 network.